

## A Review note on Butterfly Pea Flower (*Clitoria Ternatea*)

Sushmitha. G. R

*D. Pharm student*

*Varadaraja Institute of Pharmaceutical Education and Research - Tumkur, Karnataka.*

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### ABSTRACT:-

Blue butterfly pea (*Clitoria ternatea*) flower (BPF) is an underutilized plant known for several health benefits. BPF can be used for increasing consumer demand for healthy foods by replacing artificial flavours and colours.

Dyes and Food Colourings play an important role in the Food Industry. A trend was seen at that time for using natural dyes instead of artificial dyes. A natural dye can be extracted from *Clitoria ternatea* (CT/Blue pea) flower because of its vivid blue colour. The reason for this deep blue colour is because of the Anthocyanin compounds contained in the flower. *Clitoria ternatea* extraction was obtained through different methods and they vary with their manufacturing process. This plant was widely used in traditional medicine because it is rich in bioactive compounds. In treating diabetics, blood pressure, retinal damage, edema, and indigestion both the aerial and underground parts of this plant are being used. Researchers proved this plant's medicinal activities such as nootropic activity, antioxidant activity, analgesic activity, anti-inflammatory and antibacterial activity. Currently, this plant's uses are widely spread in the nanotechnology field as well.

**Keywords:** anthocyanin, *Clitoria ternatea* L., ultrasonic extraction, pH-responsive indicator, food freshness, intelligent packaging, Medicinal and Traditional uses on human body.

### I. INTRODUCTION:-

*Clitoria ternatea* is a plant that belongs to the family Fabaceae and is widely distributed in many different countries. There are 58 species of *Clitoria ternatea* spread all over the world like India,

Sri Lanka, Malaysia, Philippine Islands, Australia, Indonesia, South Africa, Australia, and around countries in the Indian Ocean.

#### • Soil and Climate Parameters

It has a fibrous root system, fertile loamy soil, and well-drained soil is preferable to its

growth. This plant can be grown easily, but it has a short life period and it is a tropical plant that grows under 19°-28° C temperature in a moderate water range (700-1500mm). Furthermore, this plant has the potential to survive up to 7-8 months even in drought conditions. (Oguis et al., 2019)[1]. There are different names used for *Clitoria ternatea* (CT) like Asian pigeon wing which is the English name for blue pea flower and 'blue pea', 'butterfly pea', 'bluebell', 'Cordofan- Pea', and 'Chandra kanta' are also known. (Vidana Gamage et al., 2021)[2]. Flowers, seeds, roots, and leaves are the edible parts of this plant that are being used in food industries, culinary uses, folk medicine & also in religious activities. In Asian countries, mostly *Clitoria ternatea* flower is blue/dark blue/purple colour but white and light-yellow colour flowers are also seen.

### Plant Profile:

Synonyms:

*Clitoria biflora* Mattei, *Clitoria bracteata* Poir., *Clitoria mearnsii* De Wild., *Clitoria tanganicensis* Micheli, *Clitoria zanzibarensis* Vatke (41).

### Taxonomic classification:

Kingdom: Plantae; Subkingdom: Viridiplantae; Infrakingdom: Streptophyta; Division: Tracheophyta; Subdivision: Spermatophytina; Infraclass: Angiospermae; Class: Magnoliopsida; Superorder: Rosanae; Order: Fabales; Family: Fabaceae; Genus: *Clitoria* L.; Species: *Clitoria ternatea*.

Common names: Arabic: Mazerion Hidi, Baslat el-Zuhoor; Bengali: Aparajita; Chinese: dou dou; English: blue-pea, bluebell vine, butterfly-pea, cordofan-pea, Darwin-pea; French: honte; German: blaue Klitorie; Hindi: Aparajita; Portuguese: clitoria-azul, clitoria; Punjabi: Koyal; Sanskrit: Girikarnika, Vishnukranta; Spanish: conchitas papito, azulejo, zapatico de la reina, zapotillo; Swedish: himmels ärt; Tamil: Kakkanam and Telugu: Dintena.

### Traditional uses:

Root was used for the treatment of ascetics, enlargement of the abdominal viscera, sore throat and skin diseases. They were also used as purgative, but because they cause griping and tenderness, they were not recommended. Root was administered with honey and ghee as a general tonic to children for improving mental faculties, muscular strength and complexion tonics. Roots were also used in epilepsy and insanity. Seeds and leaves were widely used as a brain tonic and to promote memory and intelligence. Juice and flowers were used as an antidote for snake bite. Seeds were used in swollen joints; crushed seeds are taken with cold or boiled water for urinary problems.

### Plantparts

Leaves, seeds, bark, fruits, sprouts and stems were used medicinally.

### used:

The flower was also found to have high content of calcium (3.09 mg/g), magnesium (2.23 mg/g), potassium (1.25 mg/g), zinc (0.59 mg/g), sodium (0.14 mg/g) and iron (0.14 mg/g) (Neda et al. 2013). Several studies investigated, identified and isolated the bioactive compounds from *C. ternatea* flower.

The hydrophilic phase of butterfly pea flower extract contains flavonol glycosides, anthocyanins, flavones, flavonols, phenolic acids, and cyclotides. Meanwhile, the terpenoids, alkaloids, and fatty acids were found in the lipophilic phase of butterfly pea flower extract.

### Biological Composition of Butterfly Pea Flower:-

Compounds reported to be found in the flowers are ternatin anthocyanins and various flavanol glycosides of kaempferol, quercetin and myricetin (Mukherjee et al. 2008; Kazuma et al. 2003). The leaves are pinnate with 5–7 leaflets, elliptic-oblong with a length and width range of 2.5–5.0 and 2.0–3.2 cm.



White Butterfly Pea Flower



Blue Butterfly Pea Flower



Potential Health Benefits of Butterfly Pea Flower



### Chemical Composition of Butterfly Pea Flower :-

**Supports Skin and Hair Health:** It's packed with antioxidants that may lend support to maintaining skin and hair health. Ternatins and their fellow antioxidants may offer other benefits.

1. **Antioxidant Effects:** Antioxidant fights free radicals. So, these can protect your skin and hair from damage. By using butterfly pea flower products in skincare or hair care, you may be able to reap the benefits of its antioxidants.
2. **Anti-inflammatory Properties:** Inflamed skin and hair can lead to acne and hair loss. The plant's compounds could calm inflammation. That may result in healthier skin and hair.
3. **May Promote Weight Loss:** Butterfly pea flowers may help with weight loss. Early studies suggest following potential benefits.
4. **Digestive Support:** Drinking butterfly pea flower tea may aid digestion. That could help you make the most of food nutrients and calories. This might aid in weight control.
5. **Potential Appetite Suppressant Effects:** Reports are suggesting that its extract might curb your appetite. Less appetite means fewer calories, thus culminating in weight loss. More research is needed to corroborate these benefits.
6. **Stabilizes Blood Sugar Level's** the butterfly pea flower might help to keep blood sugar levels steady. Studies have shown that drinks with its extract lead to lower blood sugar and insulin. Plus, the plant's antioxidants may guard against cell havoc related to diabetes. More studies are required on this.
7. **Improves Cognitive Function:** Early studies hint that butterfly pea flowers might boost cognitive health. Its antioxidants might guard against mind decay with age. There may be gains in memory, focus, and learning. More studies are needed to know how butterfly pea flower impacts cognitive health.

## II. CONCLUSION:

*Clitoria ternatea* has a long tradition and is found in several countries. It is not just an ornamental flower but also a good medicinal plant which has numerous benefits. It has been experimented several years back by various scientists and have found a number of pharmacological uses as well. With the advancement of technology and Ayurvedic traditional medicine and the improvement of scientific research, different classes of plant species

and their leading compounds have been studied. Extractions obtained through different methods of the roots, seeds, flowers, and leaves of CT have been experimented in Ayurvedic studies. Earlier different parts of *Clitoria ternatea* have been used for the treatment of Asthma, skin diseases, constipation, fever, Inflammation, Indigestion, snakebite and scorpion sting, etc. Later on, this plant is used for many pharmacological activities such as, memory enhancer (by increasing of acetylcholine content), act as a good stress, anxiety, and depression reliever, to gain calmness in mind and helps to have a good sleep. Moreover, it helps to lower the body temperature and also acts as a good pain reliever, the seeds are used to treat when joints in different parts of the body got swollen. It can be used to treat when difficulties in urination occur and improve the flow of urination, treat boils, blisters, and ulcers, and act as a neutralizer for poisons that enter the body. One of the most important benefits of this plant is its anti diabetic activity. Furthermore, it shows properties like antiseizure, tranquilizing, sedative, antimicrobial, insecticidal, and inhibition of blood platelet aggregation, etc. Extractions of this plant are also useful to treat many diseases still where the proper medications have not been discovered such as cancers, neuro problems, kidney-related disorders, hyperglycemia, urinary disorder, goiter, disorders in the respiratory system, etc. This plant has a good source of evidence to be used as a memory enhancer.

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